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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,384	10/17/2003	Quanyuan Shang	4432D1/DISPLAY/AKT/BG	2231
44257	7590	06/15/2006	EXAMINER	
PATTERSON & SHERIDAN, LLP			MACARTHUR, SYLVIA	
3040 POST OAK BOULEVARD, SUITE 1500			ART UNIT	
HOUSTON, TX 77056			PAPER NUMBER	

1763

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application N .</b>	<b>Applicant(s)</b>	
	10/688,384	SHANG ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Sylvia R. MacArthur	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 March 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-3, 6-13 and 17-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6-13, and 17-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-3, 7-13, and 17-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant uses the terms “actuating a substrate support” and “project” a first set of pins to describe the method of the claimed invention.

The examiner notes that actuating can be interpreted broadly in two ways. Actuating is connotated as to activate or place in motion. For the purpose of examination, in light of the specification the examiner interprets actuating as “to cause to substrate support to move vertically”. Otherwise, the reference of Harashima teaches a chuck that is activated thus moving the pins.

Likewise, the examiner has used to the broadest interpretation of the term “project”, in this case to cause to appear or thrust on a surface to reject the claims. It is unclear if the pins move as a result of the relative motion of the lift plate and the substrate support or if the pins actually have independent movement, in addition to or despite the relative motion of the support/lift plate.

Applicant is invited to clarify the correct interpretation of the claims based on the specification as originally filed.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-3, 7-13, and 17-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harashima et al (US 5,677, 824) in view of White et al (US 5,352,294).

Harashima et al teaches a method of lifting a substrate from chuck.

Regarding claims 1, 21, 23: Figs. 2A & 2B along with col. 3 lines 10-65 anticipate this claim. Namely, Harashima et al teaches projecting (thrust up) a first set of pins (release pins 1) a first distance above the surface of a substrate support, projecting a second set of lift pins 9 a second distance above the surface of the substrate support the movement of the pins is actuated when the electrostatic chuck mechanism executes its discharge mechanism (see col. 2 lines 32-49). The step of causing the substrate to form a bowed region is illustrated in Figs. 2B & 2C At the point when the lift pins 9 contact the substrate it occurs at a distance less than the first distance (lifting of the peripheral by the release pins 1) as the lift pins touch the center of the substrate, which is subsequently the bowed region.

Harashima fails to teach that the substrate support is actuated (that is moves vertically) to project the pins.

White teaches a method of dechucking a substrate actuating (shaft 118 allows the support to move up and down) a substrate-support to project a first set of lift pins (centering pins

12) a first distance above a surface of the substrate support and to project a second set of lift pins (pins 200) a second distance above the surface of the substrate support that is less than the first distance projected by the first set of lift pins; causing the substrate to form a bowed region between a plurality of the first set of lift pins by contacting the substrate with the first set of lift pins; and contacting the substrate in the bowed region with the second set of lift pins, see col. 5 lines 3-46.

The motivation to modify the apparatus of Harashima to provide for vertical movement of the support is that a moveable substrate support enhances further control of the transport of the wafer to/from the chuck.

Regarding claim 2: Lift pins 9 are located inward the release pins 1 see Fig. 2A of Harashima.

Regarding claims 3, 22, and 28: Harashima et al does not specifically teach that the projected distances are at least 2 mm apart.

Harashima et al does teach in col. 3 lines 23-36 that the distance of elevation depends on the size of the wafer.

It would have been well within one of ordinary skill in the art at the time of the claimed invention to ensure that the projected distances between the sets of pins is at least 2 mm to ensure that the wafer does not crack as taught by Harashima. The projected distance is a matter of optimization limited by the size of the wafer used.

Regarding claims 3, 22, and 28: Harashima et al or Harashima modified by White do(es) not specifically teach that the projected distances are at least 2 mm apart.

Art Unit: 1763

Harashima et al does teach in col. 3 lines 23-36 that the distance of elevation depends on the size of the wafer. It has been held by In re Boesch that it would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as the projected distances of the pins through routine experimentation in the absence of showing of criticality. The projected distance is a matter of optimization limited by the size of the wafer used.

It would have been well within one of ordinary skill in the art at the time of the claimed invention to ensure that the projected distances between the sets of pins is at least 2 mm to ensure that the wafer does not crack as taught by Harashima.

Regarding claims 7, 8, and 24: This claim is anticipated by col. 3 lines 50-65 of Harashima.

Regarding claims 9-13, 17-19, 20, 25, 26, 31 and 32: Harashima et al does not disclose a lift plate.

White et al disclose a pin support plate (Fig 3-122) for lifting the pins and a rim projecting from the central position (Fig 8-20).

The motivation to modify the apparatus of Harashima et al with that of White et al is that it provides a support plate for the two sets of lift pins. This support (lift) plate provides enhanced stability for the lift pins ensuring that they will fall through the stage when retracted/elevated.

There fore it would have been obvious to one having ordinary skill in the art at the time invention was made to replace two sets of lift mechanisms by one lift plate like that of White et al to make the lift mechanism more reliable.

Art Unit: 1763

Regarding claims 27, 30, 36: The first set of pins 1 lift the perimeter of the substrate and the second of pins 9 lift the center portion of the substrate. See Figs. 2B, 2C, and the paragraph joining cols. 2 and 3 of Harashima.

Regarding claim 29: See Figs. 2B, 2C of Harashima.

Regarding claims 33-35: This series of steps obvious occurs when offsetting and eliminating the bowing phenomena.

### ***Response to Arguments***

5. Applicant's arguments, have been considered but are moot in view of the new ground(s) of rejection. The prior art of Harashima anticipates the present invention when the term actuate is interpreted as activate and project is interpreted as thrust up. If however, actuating the support assembly is to be interpreted as moving up/down the prior art of Harashima is combined with the prior art of White. Applicant is encourage to clarify the language of claims 1 and 21 to better specify how the support assembly affects the use the pins and ensure that such clarification has support from the original specification.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. The amendment to claims 1 and 21 initiated the presentation of a new art rejection of Harashima in view of White noting the teaching of a moving susceptor.

7. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after


Art Unit: 1763

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-F during the core hours of 9 a.m. and 3 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Sylvia R MacArthur  
Patent Examiner  
Art Unit 1763

  
**PARVIZ HASSANZADEH**  
**SUPERVISORY PATENT EXAMINER**